

## Review Exercise Set 4

Exercise 1: Factor completely.

$$x^4 + 4x^2 - 32$$

Exercise 2: Factor completely.

$$x^2(x + 3) - 2x(x + 3) - 8(x + 3)$$

Exercise 3: Solve for x.

$$x^4 - 21x^2 + 54 = 0$$

Exercise 4: Solve for n

$$3n^4 + 17n^2 + 20 = 0$$

Exercise 5: Solve for t.

$$6t^4 - 29t^2 + 28 = 0$$

## Review Exercise Set 4 Answer Key

Exercise 1: Factor completely.

$$\begin{aligned}x^4 + 4x^2 - 32 &= (x^2 + 8)(x^2 - 4) \\ &= (x^2 + 8)(x + 2)(x - 2)\end{aligned}$$

$$\mathbf{(x^2 + 8)(x + 2)(x - 2)}$$

Exercise 2: Factor completely.

$$\begin{aligned}x^2(x + 3) - 2x(x + 3) - 8(x + 3) &= (x + 3)(x^2 - 2x - 8) \\ &= (x + 3)(x - 4)(x + 2)\end{aligned}$$

$$\mathbf{(x + 3)(x - 4)(x + 2)}$$

Exercise 3: Solve for x.

$$\begin{aligned}x^4 - 21x^2 + 54 &= 0 \\ (x^2 - 3)(x^2 - 18) &= 0\end{aligned}$$

$$x^2 - 3 = 0 \quad \text{or} \quad x^2 - 18 = 0$$

$$x^2 = 3 \qquad \qquad x^2 = 18$$

$$x = \pm\sqrt{3} \qquad \qquad x = \pm\sqrt{18}$$

$$x = \pm\sqrt{3} \qquad \qquad x = \pm 3\sqrt{2}$$

$$x = -3\sqrt{2}, -\sqrt{3}, \sqrt{3}, 3\sqrt{2}$$

Exercise 4: Solve for n

$$\begin{aligned}3n^4 + 17n^2 + 20 &= 0 \\ (3n^4 + 5)(n^2 + 4) &= 0\end{aligned}$$

Exercise 4 (Continued):

$$\begin{aligned}3n^2 + 5 &= 0 & \text{or} & & n^2 + 4 &= 0 \\3n^2 &= -5 & & & n^2 &= -4 \\n^2 &= -\frac{5}{3} & & & n^2 &= -4 \\n &= \pm\sqrt{-\frac{5}{3}} & & & n &= \pm\sqrt{-4} \\n &= \pm\frac{i\sqrt{15}}{3} & & & n &= \pm 2i\end{aligned}$$

$$n = -2i, \quad -\frac{i\sqrt{15}}{3}, \quad \frac{i\sqrt{15}}{3}, \quad 2i$$

Exercise 5: Solve for t.

$$\begin{aligned}6t^4 - 29t^2 + 28 &= 0 \\(3t^2 - 4)(2t^2 - 7) &= 0\end{aligned}$$

$$\begin{aligned}3t^2 - 4 &= 0 & \text{or} & & 2t^2 - 7 &= 0 \\3t^2 &= 4 & & & 2t^2 &= 7 \\t^2 &= \frac{4}{3} & & & t^2 &= \frac{7}{2} \\t &= \pm\sqrt{\frac{4}{3}} & & & t &= \pm\sqrt{\frac{7}{2}} \\t &= \pm\frac{2}{\sqrt{3}} & & & t &= \pm\frac{\sqrt{7}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} \\t &= \pm\frac{2\sqrt{3}}{3} & & & t &= \pm\frac{\sqrt{14}}{2}\end{aligned}$$

$$t = -\frac{\sqrt{14}}{2}, \quad -\frac{2\sqrt{3}}{3}, \quad \frac{2\sqrt{3}}{3}, \quad \frac{\sqrt{14}}{2}$$